WHAT IS CLAIMED IS:

1. A nucleic acid molecule comprising an aptamer and a polynucleotide that encodes a transcriptional regulatory polypeptide, wherein binding of a ligand to the aptamer inhibits translation of the transcriptional regulatory polypeptide.

2. The nucleic acid of claim 1, wherein the ligand is a cell-permeable small organic molecule.

3. The nucleic acid of claim 2, wherein the ligand is Hoechst dye 33258.

4. The nucleic acid of claim 1, wherein the ligand is a metal ion.

5. The nucleic acid of claim 1, wherein the ligand is an antibiotic.

6. The nucleic acid of claim 1, wherein the ligand is a steroid.

7. The nucleic acid of claim 1, wherein the transcriptional regulatory polypeptide is a repressor.

8. The nucleic acid of claim 1, wherein the transcriptional regulatory polypeptide is a transcriptional activator.

9. The nucleic acid of claim 1, wherein the transcriptional regulatory polypeptide is a coactivator.

10. The nucleic acid of claim 1, wherein the transcriptional regulatory polypeptide comprises a DNA-binding domain.

11. The nucleic acid of claim 10, wherein the DNA-binding domain is that of a protein selected from the group consisting of E2F-1, GAL4, a STAT protein, a steroid/thyroid receptor protein, a Cys2-His2 zinc finger DNA binding motif, and a tetracycline repressor.

12. The nucleic acid of claim 1, wherein the transcriptional regulatory polypeptide comprises a transcriptional repressor domain.

13. The nucleic acid of claim 12, wherein the transcriptional repressor domain is that of a protein selected from the group consisting of Rb protein, v-erbA, retinoic

acid receptor alpha, thyroid hormone receptor alpha, yeast Ssn6/Tup1 protein complex, SIR1, NeP1, TSF3, SFI, WT1, Oct-2.1, E4BP4, KRAB and ZF5.

14. The nucleic acid of claim 12, wherein the transcriptional repressor domain is that of p53.

15. The nucleic acid of claim 1, wherein the transcriptional regulatory polypeptide comprises a transcriptional activation domain.

16. The nucleic acid of claim 1, wherein the nucleic acid is an mRNA molecule.

17. The nucleic of claim 16, wherein the mRNA is bound to a ligand.

18. An expression cassette that comprises a promoter operably linked to a polynucleotide from which is transcribed the nucleic acid of claim 1.

19. An expression vector that comprises the expression cassette of claim 18.

20. The expression vector of claim 19, wherein the expression vector is a viral vector.

21. The expression vector of claim 20, wherein the viral vector is selected from the group consisting of an adenoviral vector, a retroviral vector, and an adeno-associated viral vector.

22. The expression vector of claim 19, wherein the expression vector is a nonviral vector.

23. The expression vector of claim 19, wherein the expression vector further comprises a second polynucleotide, wherein transcription of the second polynucleotide is regulated by the transcriptional regulatory polypeptide.

24. The expression vector of claim 23, wherein the second polynucleotide encodes a therapeutic polypeptide.

25. The expression vector of claim 23, wherein the second polynucleotide is operably linked to a binding site for the transcriptional regulatory polypeptide.

26. A cell that comprises the nucleic acid molecule of claim 1.

27. The cell of claim 26, wherein the cell further comprises a second polynucleotide, wherein transcription of the second polynucleotide is regulated by the transcriptional regulatory polypeptide.

28. The cell of claim 27, wherein the second polynucleotide is included in the nucleic acid.

29. The cell of claim 27, wherein transcription of the second polynucleotide yields an antisense nucleic acid.

30. The cell of claim 27, wherein the second polynucleotide encodes a polypeptide.

31. The cell of claim 30, wherein the polypeptide is a therapeutic polypeptide.

32. The cell of claim 31, wherein the therapeutic polypeptide is selected from the group consisting of a toxin, a cytokine, a kinase, a phosphatase, a transcriptional regulatory protein, an antibody, and a tumor suppressor.

33. The cell of claim 32, wherein the polypeptide is a tumor suppressor.

34. The cell of claim 33, wherein the tumor suppressor is p53.

35. The cell of claim 26, wherein the cell further comprises a ligand that binds to the aptamer.

36. A method of regulating expression of a gene, the method comprising:

contacting with an aptamer-binding ligand an RNA that comprises an aptamer and a polynucleotide that encodes a transcriptional regulatory polypeptide that regulates expression of the gene;

wherein the ligand binds to the aptamer, thus inhibiting translation of the transcriptional regulatory polypeptide resulting in a change in the expression level of the gene.

37. The method of claim 36, wherein the change in the expression level of the gene is proportional to the amount of aptamer-binding ligand administered.

38. The method of claim 36, wherein the transcriptional regulatory polypeptide is a repressor, whereby binding of the ligand to the aptamer inhibits translation of the repressor thus causing an increase in the expression level of the gene.

39. The method of claim 36, wherein the transcriptional regulatory polypeptide is a transcriptional activator, whereby binding of the ligand to the aptamer inhibits translation of the transcriptional activator thus causing a decrease in the expression level of the gene.

40. The method of claim 36, wherein the gene comprises a binding site for the transcriptional regulatory polypeptide.

41. The method of claim 36, wherein the gene is included in a chromosome.

42. The method of claim 36, wherein the gene is extrachromosomal.

43. The method of claim 36, wherein the mRNA is contained in a cell.

44. The method of claim 43, wherein the cell is part of a multicellular organism.

45. The method of claim 44, wherein the contacting is accomplished by administering the ligand to the organism.

46. The method of claim 36, wherein the RNA is transcribed from an expression cassette that comprises a promoter operably linked to a polynucleotide from which is transcribed the RNA.

47. The method of claim 46, wherein the promoter is a constitutive promoter.

48. A method of retarding undesirable cell proliferation, the method comprising administering to undesirably proliferating cells:

a nucleic acid construct that comprises a promoter operably linked to a polynucleotide, wherein the polynucleotide is transcribed to yield an mRNA that comprises an aptamer and a polynucleotide sequence that encodes a transcriptional regulatory polypeptide that regulates expression of a gene involved in regulation of cell proliferation;

an aptamer-binding ligand that binds to the aptamer;

wherein the binding of the ligand to the aptamer inhibits translation of the transcriptional regulatory polypeptide, thus causing a change in the expression level of the gene, which change in expression level ameliorates the undesirable cell proliferation.

49. The method of claim 48, wherein the gene involved in regulation of cell proliferation is a tumor suppressor gene and the transcriptional regulatory polypeptide is a repressor, whereby binding of the ligand to the aptamer results in an increase in the tumor suppressor gene expression level.

50. The method of claim 48, wherein the gene involved in regulation of cell proliferation is a transgene.

51. The method of claim 50, wherein the gene comprises a promoter operably linked to a polynucleotide that encodes a polypeptide involved in regulation of cell proliferation.

52. The method of claim 51, wherein the promoter is a constitutive promoter.

53. The method of claim 50, wherein the gene is included on an expression vector that is administered to the undesirably proliferating cells.

54. The method of claim 53, wherein the expression vector further comprises the nucleic acid construct.

55. The method of claim 48, wherein the nucleic acid construct is included on an expression vector that is administered to the undesirably proliferating cells.